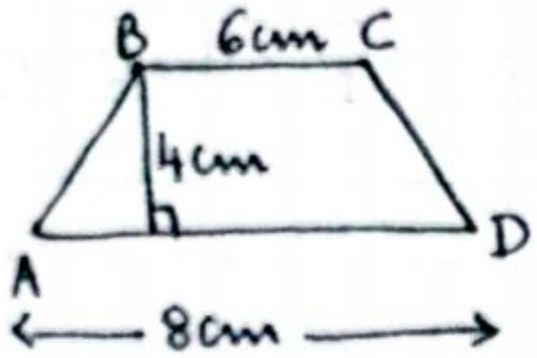
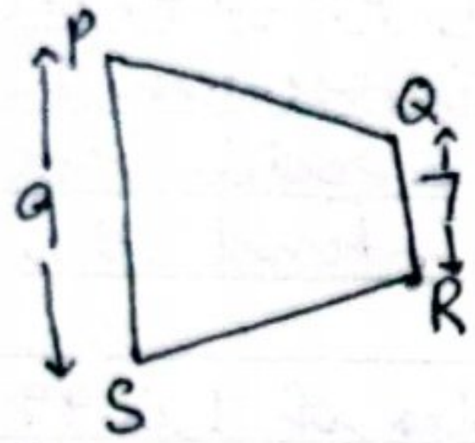
VIII Mensuration (H.W – 23rd Feb)

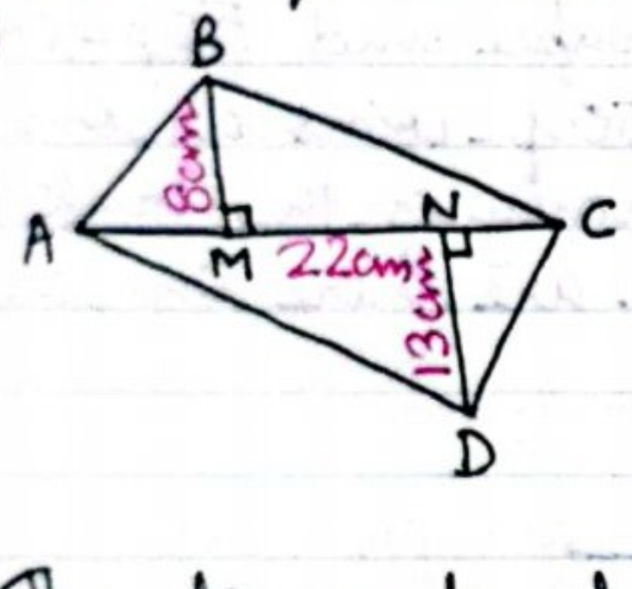
1) 

The area of a trapezium ABCD is
(a) 24 sq.cm (b) 28 sq.cm
(c) 26 sq.cm (d) 22 sq.cm

2) 

PQRS has area 24 sq.units. The distance between PS and QR is
(a) 4 units (b) 6 units (c) 3 units (d) 2 units

3) The area of a rhombus PQRS whose diagonals are 7cm and 6cm is
(a) 21 sq.cm (b) 28 sq.cm (c) 24 sq.cm (d) 26 sq.cm

4) 

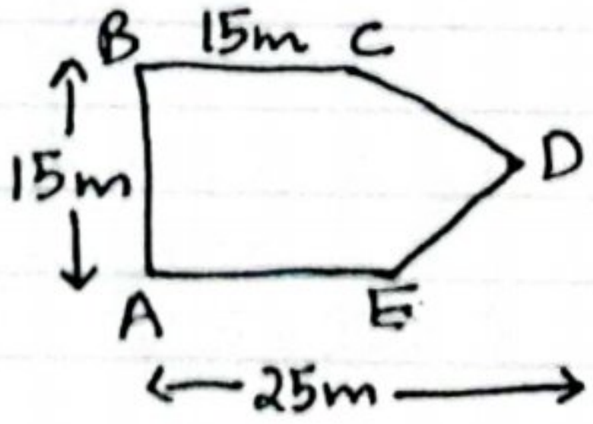
BM = 8cm
DN = 13cm
AC = 22cm
Area of ABCD is
(a) 213 sq.cm (b) 231 sq.cm
(c) 143 sq.cm (d) 234 sq.cm

5) The diagonals of a rhombus are 6.5cm and 10cm. Its area is
(a) 65 sq.cm (b) 32.5 sq.cm (c) 33 sq.cm (d) 45 sq.cm

6) The area of a trapezium is 198 sq.cm and distance between its parallel sides is 12cm. The sum of the parallel sides is
(a) 32cm (b) 33cm (c) 36cm (d) 42cm

7) The area of a trapezium is 28 sq.cm and one of its parallel sides is 8cm. If the distance between parallel sides is 4cm, then the other parallel side is
(a) 8cm (b) 7cm (c) 9cm (d) 6cm.

8) The area of the park ABCDE is
(a) 300 m^2 (b) 325 m^2 (c) 275 m^2
(d) 350 m^2



9) The sum of the lengths of the base of a trapezium whose altitude is 11cm and area is 55 sq·cm is
(a) 12cm (b) 10cm (c) 8cm (d) 16cm.

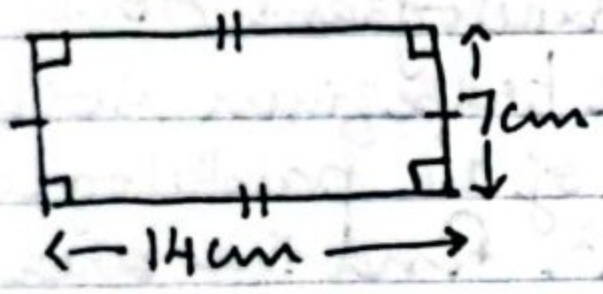
Fill in the blanks

1) If the side of a square is doubled, its area becomes ___
2) The area of a rhombus whose diagonals are 10cm and 12cm is ___
3) The altitude of a $\triangle$ whose area is $96cm^2$ and base is 16cm is ___
4) The area of a parallelogram is $525cm^2$ and its height is 25cm. The length of the base of parallelogram is ___
5) The area of a trapezium whose parallel sides are 30cm and 25cm respectively and the perpendicular distance between them is 14cm is ___

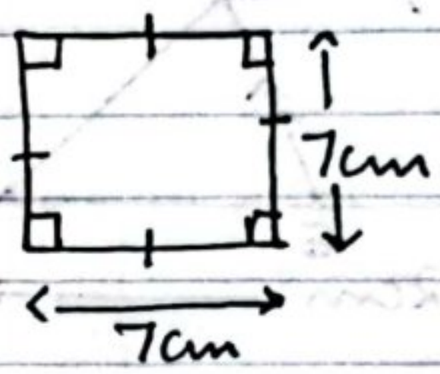
Answer the following

1) Find the area and perimeter:

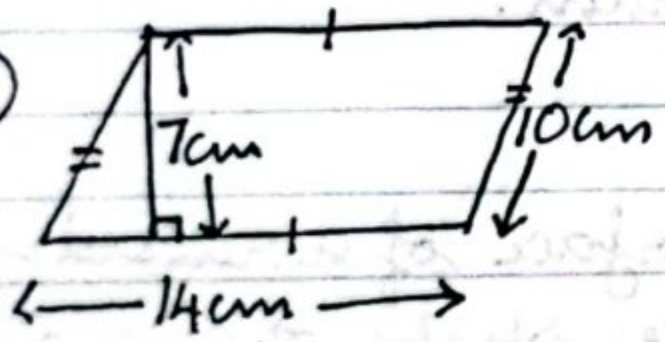
(i)



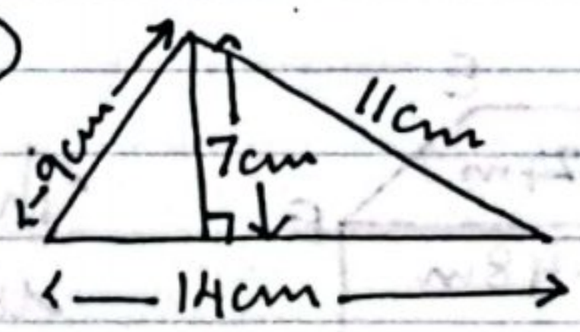
(ii)



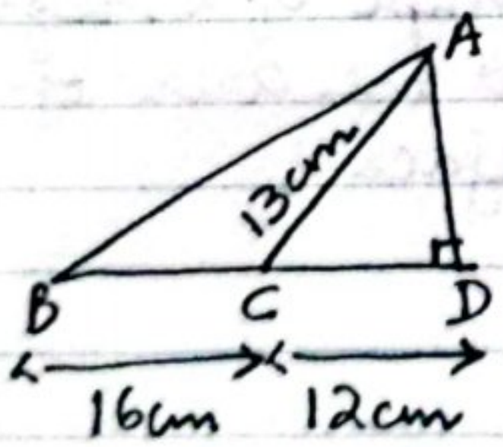
(iii)



(iv)



2)



Find the area of the $\triangle ABC$

3) Find the area of a trapezium whose parallel sides are 26cm and 14cm and the distance between them is 12cm.
4) The parallel sides of a trapezium are 20cm and 8cm. Its each of the non-parallel sides are 10cm. Find the area of the trapezium.

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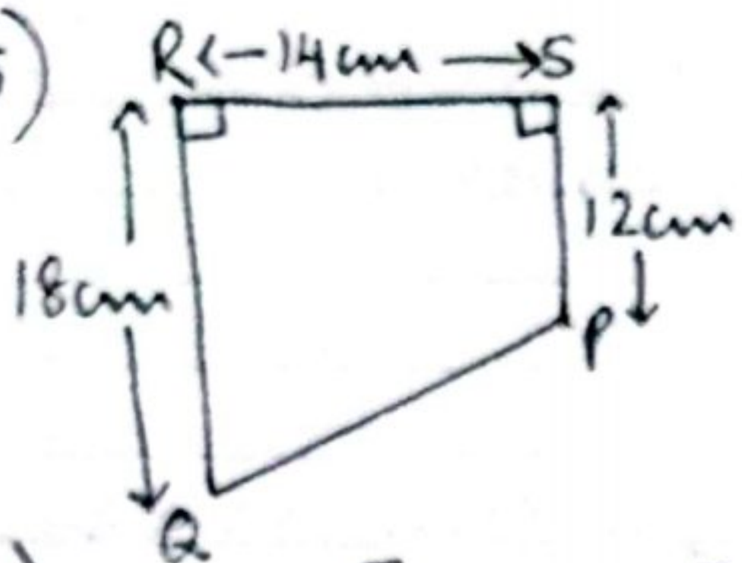
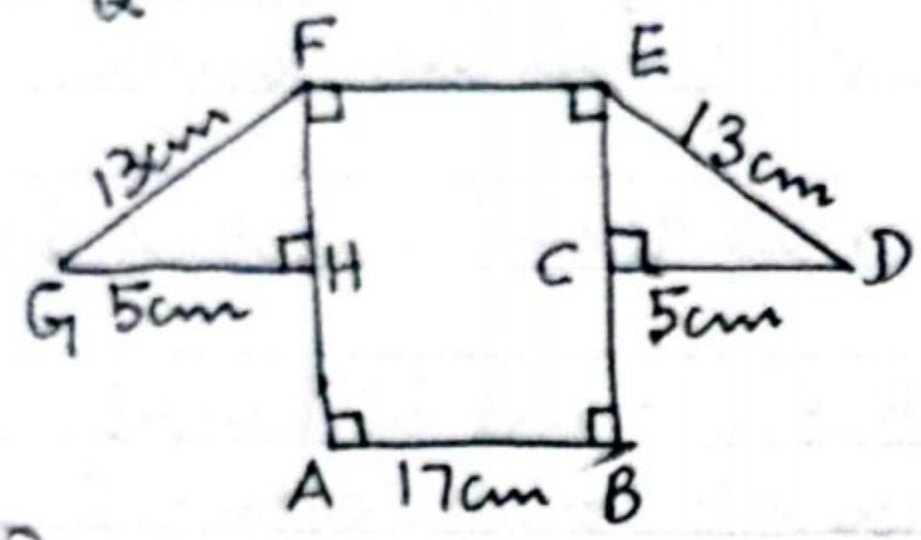
5) 

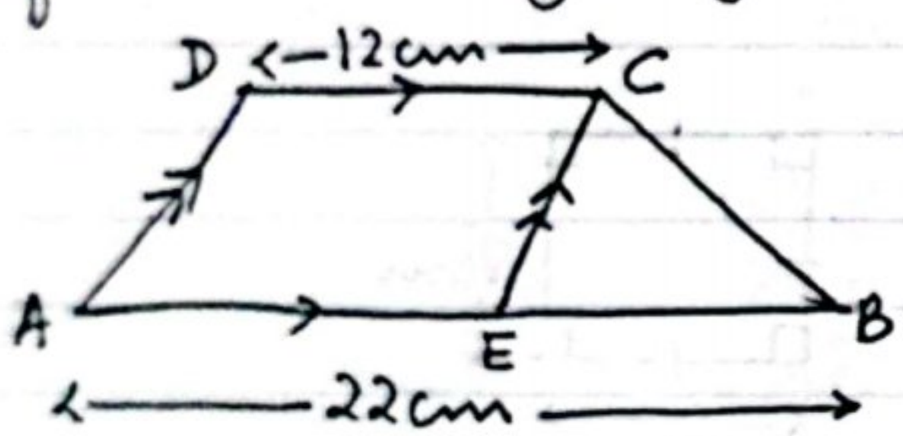
find the area of trap. PQRS

6) 

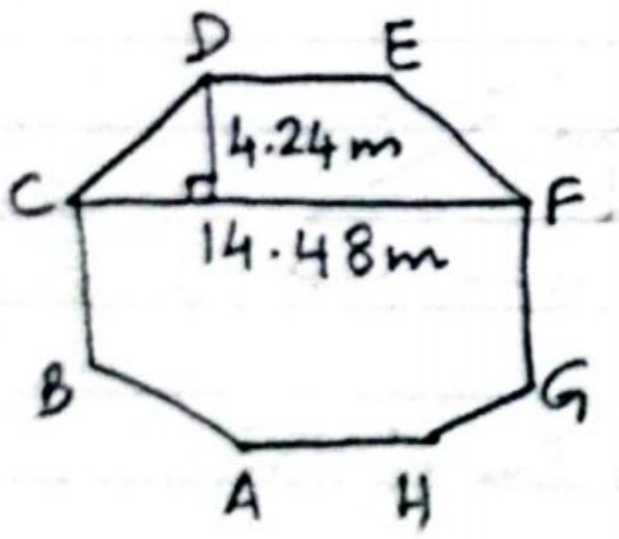
Find the area enclosed by the given figure.

7) Find the area of a rhombus whose side is 8cm and whose altitude is 6cm. If one of the diagonals is 10cm long, find the length of the other diagonal.

8) The area of trapezium is $98cm^2$ and its height is 7cm. If one of the parallel sides is 6cm longer than the other, find the length of two parallel sides.

9) 

A parallelogram A C is drawn in a trapezium ABCD. The area of the parallelogram is $96cm^2$. Find the area of the trapezium.

10) 

The top surface of a raised platform is in the shape of a regular octagon. Find the area of the octagonal surface.

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VIII **Mensuration** (H.W – 23rd February – Answers)

1) area (trap. ABCD) $= \frac{1}{2}(AD+BC)\times h = \frac{1}{2_1}(8+6)\times \cancel{4}^{2}$

$= 14\times 2 = 28$ sq.cm (b)

2) area(trap. PQRS) $= \frac{1}{2}(PQ+QR)\times h = 24$

$\Rightarrow \frac{1}{2}(9+7)\times h = 24$

$= \frac{1}{\cancel{2}_1}\times \cancel{16}^{8}\times h = 24$

$\therefore h = \frac{24}{8} = 3$ units (c)

3) area(rh. PQRS) $= \frac{1}{2}\times d_1 \times d_2$

$= \frac{1}{\cancel{2}_1}\times 7\times \cancel{6}^{3} = 21 cm^2$ (a)

4)

area(ΔABC) $= \frac{1}{2}\times AC \times BM = \frac{1}{\cancel{2}_1}\times \cancel{22}^{11}\times 8 = 88\ cm^2$ //

area(ΔADC) $= \frac{1}{2}\times AC \times DN = \frac{1}{\cancel{2}_1}\times \cancel{22}^{11}\times 13 = 143\ cm^2$ //

$\therefore$ area(quad. ABCD) = area(ΔABC) + area(ΔADC)

$= 88+143 = 231$ sq.cm (b)

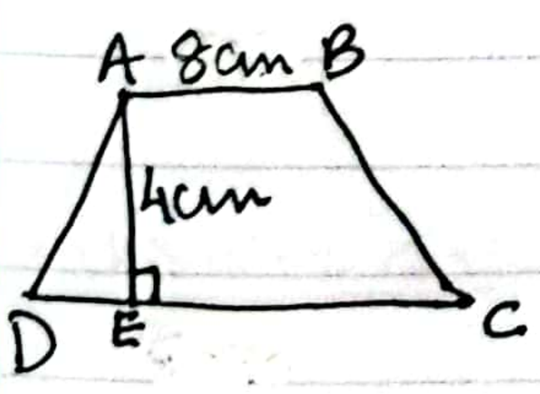
5) area of rhombus $= \frac{1}{2}\times d_1 \times d_2 = \frac{1}{\cancel{2}_1}\times 6.5\times \cancel{10}^{5} = \underline{32.5}$ sq.cm (b)

6) area of trapezium $= \frac{1}{2}$ (sum of parallel sides) $\times$ height

$\Rightarrow 198 = \frac{1}{2}$ (sum of parallel sides) $\times 12$

$\therefore$ Sum of parallel sides $= \frac{\cancel{198}^{33}\times 2}{\cancel{12}_{\cancel{6}_1}} = 33$cm (b)

7)



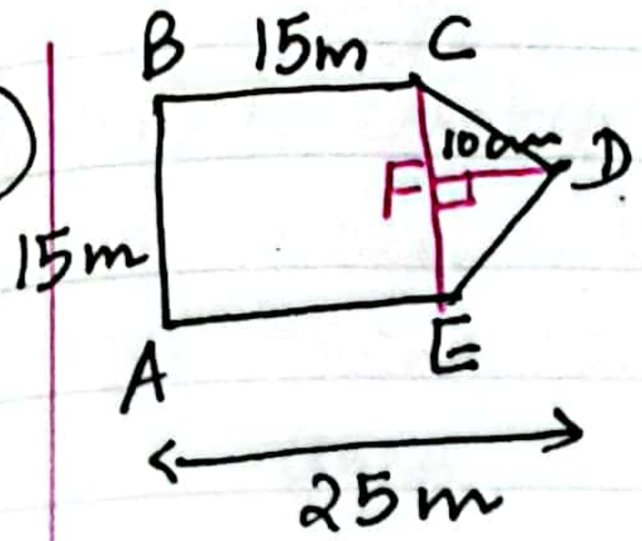
area of (trap. ABCD) $= \frac{1}{2}(AB+CD)\times AE$

$28 = \frac{1}{\cancel{2}_1}(8+CD)\times \cancel{4}^{2}$

$8+CD = \frac{28}{2} = 14$

$\therefore CD = 14-8 = 6$cm (d)

8)



$DF = 25 - 10 = 10\,cm$

$area(square\ ABCE) = side \times side$

$= 15 \times 15 = 225\ m^2$

$area(\triangle CDE) = \frac{1}{2} \times CE \times FD = \frac{1}{2} \times 15 \times 10^{5}$

$= 75 m^2$

$\therefore area(park\ ABCDE) = area(sq.ABCE) + area(\triangle CDE)$

$= 225 + 75 = 300\ m^2$ (a)

9) $area\ of\ trapezium = \frac{1}{2}(sum\ of\ parallel\ sides) \times h$

$\Rightarrow 55 = \frac{1}{2}(sum\ of\ parallel\ sides) \times 11$

$\therefore Sum\ of\ parallel\ sides = \frac{2 \times 55^{5}}{11} = 10cm$ (b)

fill in the blanks

1) Area of Square $= (2a)^2 = 4a^2 = 4(a^2)$, 4 times

2) $\frac{1}{2} \times d_1 \times d_2 = \frac{1}{2_1} \times 10^{5} \times 12 = 60\,cm^2$

3) $area\ of\ \triangle = \frac{1}{2} \times b \times h$

$\Rightarrow 96 = \frac{1}{2} \times 16 \times h$

$\therefore h = \frac{96 \times 2^{1}}{16_{8}} = 12cm$

4) $area\ of\ parallelogram = b \times h$

$525 = b \times 25$

$\therefore b = \frac{525}{25} = 21cm$

5) $area\ of\ trapezium = \frac{1}{2}(sum\ of\ parallel\ sides) \times h$

$= \frac{1}{2_1}(30 + 25) \times 14^{7} = 55 \times 7 = 385\,cm^2$

Answer the following

1) (i) $Perimeter = 2(l + b) = 2(14 + 7) = 2 \times 21 = 42cm$ //

$area = l \times b = 14 \times 7 = 98\,cm^2$ //

(ii) $Perimeter = 4a = 4 \times 7 = 28\,cm$ //

$area = a^2 = 7^2 = 49\,cm^2$ //

(iii) Perimeter = Sum of all sides = 14+10+14+10 = 48cm //

area = b×h = 14×7 = 98cm² //

(iv) Perimeter = sum of all sides = 9+14+11 = 34 cm //

area = $\frac{1}{2}bh = \frac{1}{2} \times 14 \times 7 = 49cm^2$ //

2) Using Pythagoras Theorem in rt. $\triangle ACD$, $AD^2 = AC^2 - CD^2$

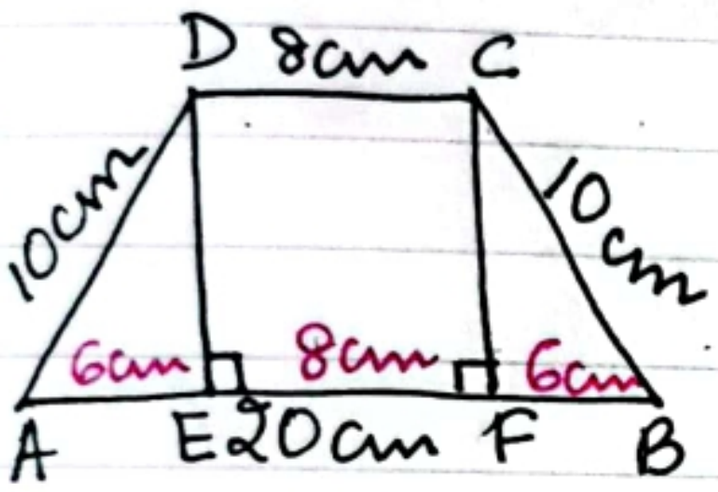
$= 13^2 - 12^2$

$= 169 - 144 = 25$

$AD = 5cm$

area $(\triangle ABC) = \frac{1}{2} \times BC \times AD = \frac{1}{2} \times 16 \times 5 = \underline{40cm^2}$

3)



Construction: draw DE ⊥ AB and draw CF ⊥ AB.

$EF = \frac{AB - DC}{2} = \frac{20-8}{2} = \frac{12}{2} = 6cm$

Using Pythagoras theorem in rt. $\triangle DEA$, $DE^2 = AD^2 - AE^2$

$= 10^2 - 6^2$

$= 100 - 36 = 64$

$DE = \sqrt{64} = 8cm$

$\therefore$ area of trapezium $= \frac{1}{2}(AB+DC) \times DE = \frac{1}{2}(20+8) \times 8$

$= \frac{1}{2} \times 28 \times 8 = \underline{112cm^2}$

4) area of trapezium $= \frac{1}{2}$ (sum of parallel sides) × h

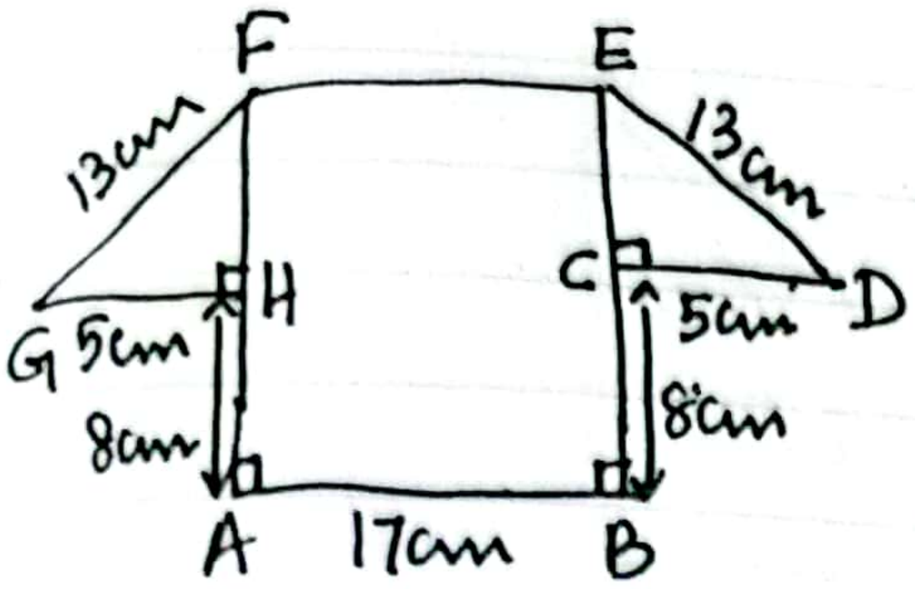
$= \frac{1}{2}(26+14) \times 12 = \frac{1}{2} \times 40 \times 12$

$= \underline{240cm^2}$

5) area of trap. PQRS $= \frac{1}{2}(RQ+SP) \times RS = \frac{1}{2}(18+12) \times 14$

$= \frac{1}{2}(30) \times 14 = \underline{210cm^2}$

6)



Using Pythagoras theorem in ΔFGH, $FH^2 = FG^2 - GH^2$

$= 13^2 - 5^2 = 169 - 25$

$= 144$

$FH = \sqrt{144} = 12cm$

$\therefore EC = FH = 12cm$

$FA = EB = 12 + 8 = 20cm$

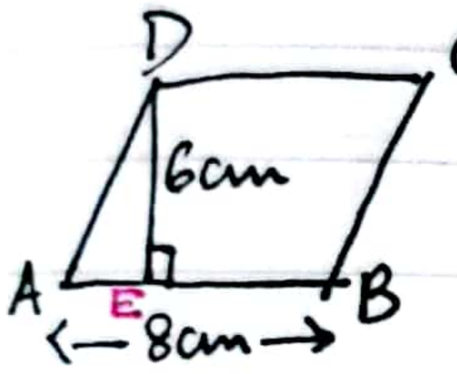
area (rect. ABEF) $= AB \times BE = 17 \times 20 = 340cm^2$

area (ΔFGH) $= \frac{1}{2} \times GH \times FH = \frac{1}{2} \times 5 \times 12 = 5 \times 6 = 30cm^2$

$\therefore$ area enclosed by the given figure $= 340 + 2 \times 30$

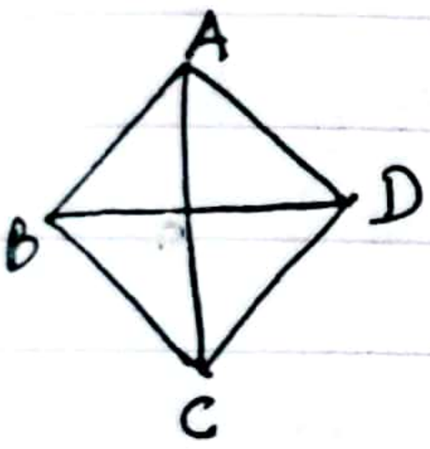
$= 340 + 60 = \underline{\underline{400cm^2}}$

7)



Area of rhombus ABCD $= b \times h = AB \times DE$

$= 8 \times 6 = \underline{\underline{48cm^2}}$



Also, area of rhombus $= \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times AC \times BD$

$\Rightarrow 48 = \frac{1}{2} \times 10 \times d_2$

$\therefore d_2 = \frac{48 \times 2}{10} = \frac{96}{10} = 9.6cm$

Hence, the length of the other diagonal $= 9.6cm$

8) Let the parallel sides be $x$cm and $(x+6)$cm.

area of trapezium $= \frac{1}{2}$ (sum of parallel sides) $\times h = 98cm^2$

$\Rightarrow \frac{1}{2}(x + x + 6) \times 7 = 98$

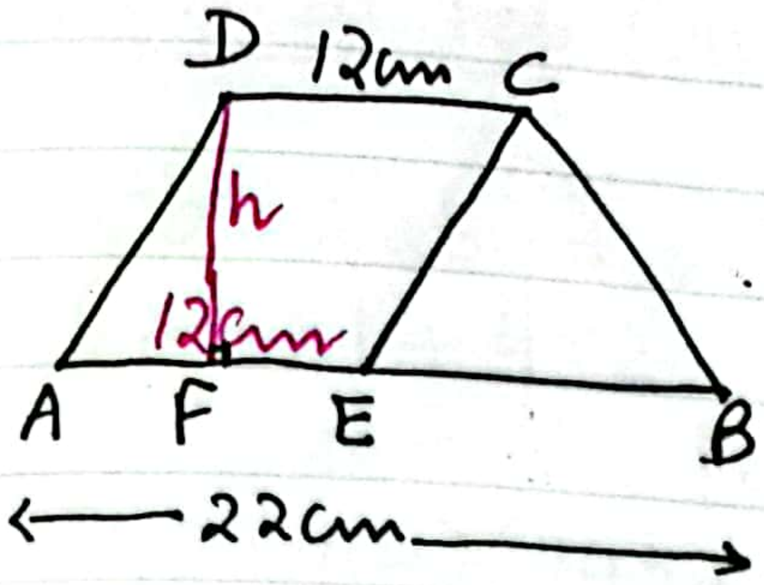
$\Rightarrow 2x + 6 = \frac{\cancel{98}^{14} \times 2}{\cancel{7}1} = 28$

$\therefore 2x = 28 - 6 = 22$

$x = 11$

Hence, the length of two parallel sides $= 11cm$ and $17cm$

9)



area of ||gm AECD = b × h

$96 = AE \times DF$

$96 = 12 \times DF$

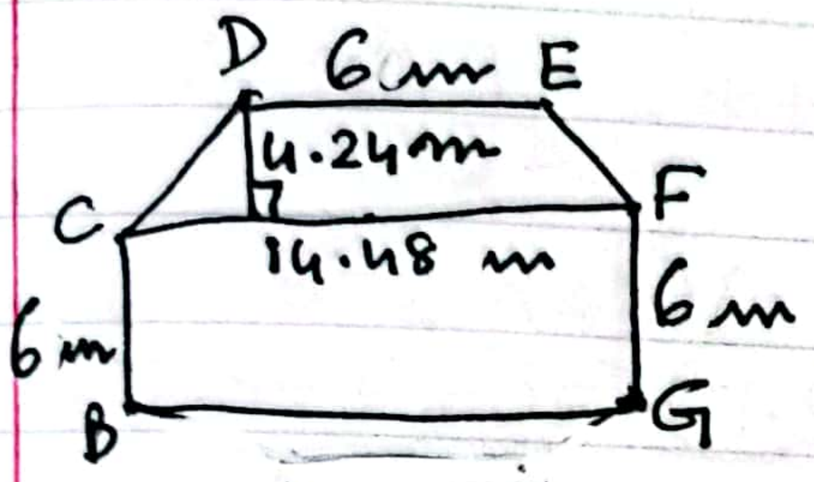
$\therefore DF = \frac{96}{12} = 8\ cm$

area of trapezium ABCD $= \frac{1}{2}(AB + DC) \times DF$

$= \frac{1}{2_1}(22+12) \times \cancel{8}^{4} = 34 \times 4$

$= 136\ cm^2$

10)



Area of octagon ABCDEFGH

= 2 × area of trapezium + area of rectangle.

area of trapezium $= \frac{1}{2}(a+b) \times h = \frac{1}{2_1}(6+14.48) \times \cancel{14.24}^{7.12}$

$= 20.48 \times 7.12 = 145.8176\ m^2$

area of rectangle $= l \times b = 6 \times 14.48 = 86.88\ m^2$

$\therefore$ area of octagon ABCDEFGH $= 2 \times 145.8176 + 86.88$

$= 291.6352 + 86.88$

$= 378.5152$

$\approx 378.52\ m^2$